

FINAL REPORT

Microbiological Sampling Report

for

National Oceanic & Atmospheric Administration

Samplings Conducted on the Tenth Floor
of Building SSMC-3
on February 8, 2000

Interagency Agreement #: D8H00CO31200

Task: 9903

January 12, 2001

Prepared by
US Public Health Service
Division of Federal Occupational Health
Bethesda Central Office

Executive Summary

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted microbiological samplings in rooms 10627, 10628, 10632, 10636, 10637, 10640, 10651, 10652, and 10653 of Building SSMC-3, located at 1315 East-West Highway, Silver Spring, Maryland. Sampling was conducted on February 8, 2000. Air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected from these rooms and an indoor reference room 10670. Air samples were also collected from outdoors.

Findings are as follows:

- Due to winter season, airborne fungal and spore levels were low.
- Very low fungal burden was detected from wipe samples collected from surfaces of supply diffusers and return troughers in light fixture.
- In general, fungal burden on vertical surfaces was lower than that of horizontal surfaces.
- *Stachybotrys chartarum* was not detected from any air, wipes, or contact plate samples collected.
- Fungal levels in plenum, carpet, and furniture dust of these rooms were at 10^3 - 10^4 CFU/g of fine dust levels. *Stachybotrys chartarum* was detected from six of 27 dust samples.

INTRODUCTION

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) conducted microbiological samplings in rooms 10627, 10628, 10632, 10636, 10637, 10640, 10651, 10652, and 10653 of Building SSMC-3, located at 1315 East-West Highway, Silver Spring, Maryland. Sampling was conducted on February 8, 2000. Air (both Andersen[®] and Zefon[®]), swab, contact plate, and vacuum dust samples were collected from these rooms and an indoor reference room 10670. Air samples were also collected from outdoors.

EVALUATION METHODOLOGY

Air Samples

Various types of samples were collected from these rooms on February 8, 2000. Two types of air samples were collected from each room: (1) culturable method using Andersen[®] N-6 samplers at a flow rate of 28.3 L/min, and (2) non-culturable method using Zefon[®] Air-O-Cell cassettes at a flow rate of 15 L/min. Indoor Andersen[®] air samples were collected for 3 minutes and outdoor samples were collected for both one and three minutes. Two percent (2 %) malt extract agar (MEA) and cellulose Czapek agar (CCA) was used to recover general fungi and cellulose-loving fungi, respectively. Non-culturable air samples were collected at the aforementioned sampling locations. Indoor samples were collected from ten minutes and outdoor samples were collected for both five and ten minutes. Outdoor air samples were collected near the entrance of the building. Temperature and relative humidity measurements were collected from each air sampling location by a battery operated, direct readout Hygroskop[®] meter.

Contact Plate Samples

To determine fungal burden on horizontal and vertical surfaces of these rooms, five to eight contact plate samples were collected from each room. Samples were collected from randomly selected horizontal and vertical surfaces. Sampling was conducted by pressing the MEA-filled Rodac[®] plate against the surface of interest for five seconds. A total of 70 contact plate samples were collected.

Swab Samples

Swab samples were collected from surfaces of each supply diffusers and return troughers in each room. They were collected by wiping a known area of surface with a sterile cotton swab (Culturette[®]) wetted with holding media. Approximately 5 in² area was wiped for return trougher and 4 in² for supply diffusers. The swab was then placed directly into its holder. Each holder was labeled with an identifiable number. A total of 38 wipe samples were collected from these rooms.

Vacuum Dust Samples

Dust accumulated on carpeting, chairs and fabric system furniture, and the plenum were collected with a High Efficiency Particulate Air (HEPA) vacuum attached with a special “sock” device. For each carpet sample, a 3-ft by 3-ft area was vacuumed for at least five minutes. Total surface areas of 9 ft² were vacuumed from system furniture and chairs, and composite as one sample. Dust accumulated above the ceiling plenum was also vacuumed and composite as one sample. One carpet sample, one composite furniture sample, and one composite plenum sample were collected from each room.

All samples collected were sent for next morning delivery to FOH’s Environmental Microbiology Laboratory (EML) in Philadelphia, Pennsylvania for analysis.

Laboratory Procedures

Upon receipt, all Andersen[®] air and contact plate samples were incubated in a 25°C incubator. Each swab sample was suspended in sterile distilled water, diluted serially, and inoculated onto agar plates. Both MEA and CCA were used for retrieving fungi. At least three dilution series were used for each sample. Each vacuum dust sample was sieved through a 250 mm sieve. The fine dust (< 250 mm) retrieved was then weighed and followed the dilution plating for fungal analysis.

All plates were incubated in a 25°C incubator. They were examined every other day for up to 10 days to ensure the full recovery of fungi. Fungal identification was based on colony morphology, spores and conidia formation. Total fungal colonies formed on each MEA plate and *Stachybotrys chartarum* on CCA plates were counted and recorded. Fungal levels in samples were presented as colony forming units (CFUs) per measuring unit. For example, CFU/m³ for Andersen[®] air samples, CFU/in² for wipe samples, CFU/plate for contact plate samples, and CFU/g of fine dust for vacuum dust samples.

All Zefon[®] cassette samples were analyzed by the Environmental Microbiology Laboratory in Escondido, California for direct microscopic examination. Fungal spores were identified and their airborne levels

were presented as spores/m³.

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RESULTS AND DISCUSSION

Temperature and Relative Humidity

Indoor temperature and relative humidity measurements ranged from 71.4°F to 77.6°F, and 13.2% – 16.3%, respectively (Table 1). Outdoors temperature reading was lower (33.9°F), but with a higher relative humidity (29.3%).

Microbiological Analyses Results

All laboratory analytical reports from FOH's EML are presented in Attachment A in a laboratory report #NOAA-00-28R. Results from direct microscopic examination of Zefon[®] samples are presented in Attachment B.

Air Samples

Andersen Results

Due to winter season, no fungal growth was detected from any indoor air samples. Outdoor airborne fungal levels were low, 35 – 71 CFU/m³ (Table 1). *Penicillium*, *Cladosporium*, and yeast were detected from outdoors. *Stachybotrys chartarum* was not detected from these samples.

Table 1. Temperature and relative humidity measurements and airborne fungal levels at different rooms of the 10th floor in SSMC-3 on February 8, 2000.

Rooms	10627	10628	10632	10636	10637	10640	10651	10652	10653	10670	Outdoors
Parameters										Ref#	
Temperature											
(°F)	73.9	72.7	71.4	76.6	72.5	71.6	71.5	72.4	77.6	71.4	33.9

Relative Humidity (%)	15.2	16.0	16.2	13.7	15.5	16.0	16.3	15.3	13.2	15.7	29.3
Airborne Fungal Levels (CFU/m³)	<12	<12	<12	<12	<12	<12	<12	<12	<12	<12	71* 35
Total Fungal Spores (Spores/m³)	7	20	<7	7	14	<7	<7	66	<7	7	27* 93

Indoor reference.

* Two samples were collected from outdoors.

Zefon Results

Indoor spore levels were low, ranged from below the detection limit of 7 spores/m³ to 66 spores/m³ (Table 1). Outdoor spore levels were 27 and 93 spores/m³. Fungal spores detected from both indoors and outdoors were *Cladosporium*, *Penicillium/Aspergillus* types, Basidiospores. *Stachybotrys chartarum* was not detected from any sample collected.

Wipe Samples

Most (34 out of 38) samples collected from surfaces of supply diffusers and return troughers in light fixtures were below the detection limits (BDL) (10 CFU/in² for supply diffuser and 8 CFU/in² for return trougher). The four samples showing fungal growth had low fungal levels (10 CFU/in²).

Contact Plate Samples

In general, higher fungal levels were detected from the horizontal surfaces than vertical surfaces (Table 2). Almost half of samples (33 of 70) collected did not show fungal growth. Fungal levels ranged from BDL of 1 CFU/plate to 13 CFU/plate. *Cladosporium* was the predominant fungal genus recovered, followed by *Aspergillus*, and *Penicillium*.

Vacuum Dust Samples

Diverse fungal genera, such as *Alternaria*, *Aspergillus*, *Aureobasidium*, *Bipolaris*, *Cladosporium*, *Epicoccum*, *Paecilomyces*, *Penicillium*, *Rhizopus*, *Trichoderma*, Ascomycetes, and Basidiomycetes were recovered from these dust samples. Fungal levels on these fine dust samples were at 10^3 - 10^4 CFU/g of fine dust levels (Table 3).

Plenum Dust

The sample collected from 10607 served as an indoor reference. Dust was collected from other six locations. *Penicillium* was the predominant fungal genera detected from these samples followed by *Cladosporium* and *Aspergillus*. *Stachybotrys chartarum* was detected from room 10653. As compared to indoor reference, higher fungal levels were detected from rooms 10651 and 10627. *Penicillium* dominated these two samples.

Carpet Dust

Predominant fungal genus detected was *Penicillium* followed by *Cladosporium* and *Alternaria*. *Stachybotrys chartarum* was detected from carpet dust samples collected from rooms 10632, 10640, and 10652. Fungal level in dust collected from room 10636 was dominated by *Penicillium*.

Furniture Dust

Aureobasidium, *Alternaria*, *Cladosporium*, *Penicillium*, and *Epicoccum* were recovered from these samples. *Stachybotrys chartarum* was detected from carpet dust samples collected from rooms 10628 and 10640. As compared to indoor reference, higher fungal levels were detected from rooms 10636, 10651, 10652, and 10653.

Table 2. Fungal levels (CFU/plate) on horizontal and vertical surfaces of different rooms at the 10th floor of SSMC-3, by contact plate sampling collected on February 8, 2000.

Rooms	10627	10628	10632	10636	10637	10640	10651	10652	10653	10670
										Ref#
Horizontal Surfaces (CFU/plate)	1 – 13* (4**)	<1 – 6 (4)	<1 – 2 (3)	<1 – 1 (4)	1 – 4 (4)	3 (3)	<1 – 4 (4)	<1 – 8 (4)	1 – 3 (4)	<1 – 9 (3)

Vertical Surfaces	<1	<1 – 1	<1	<1 – 1	<1 – 3	<1 – 2	<1 – 1	<1	<1 – 4	<1
(CFU/plate)	(4)	(3)	(2)	(4)	(4)	(2)	(4)	(4)	(4)	(2)

* Ranges.

** Total sample number.

Indoor reference.

Table 3. Total fungal levels (CFU/g of fine dust) in fine dust collected from carpet, plenum, and furniture of rooms 10607, 10627, 10628, 10632, 10636, 10637, 10640, 10651, 10652, 10653, 10657, and 10670 by vacuum dust sampling, collected on February 8, 2000.

Rooms	10607	10627	10628	10632	10636	10637	10640	10651	10652	10653	10657	10670
	Ref#											Ref#
Plenum	5,545	26,000	7,200					38,000	9,600	7,129	10,400	
(CFU/g of fine dust)	(-*)	(-)	(-)	NA	NA	NA	NA	(-)	(-)	(+)	(-)	NA
Carpet		8,317	5,149	1,188	33,600	15,200	2,800	10,000	4,356	8,713		12,277
(CFU/g of fine dust)	NA**	(-)	(-)	(+)	(-)	(-)	(+)	(-)	(+)	(-)	NA	(-)
Furniture		1,471	3,883	2,500	27,722	4,091	7,250	22,000	42,000	40,000		5,941
(CFU/g of fine dust)	NA	(-)	(+)	(-)	(-)	(-)	(+)	(-)	(-)	(-)	NA	(-)

*+: *Stachybotrys chartarum* was detected on MEA and/or CCA plates.

-: *Stachybotrys chartarum* was not detected on MEA and CCA plates.

** Not applicable.

Indoor reference.

CONCLUSIONS

· Due to winter season, airborne fungal and spore levels were low.

- Very low fungal burden was detected from wipe samples collected from surfaces of supply diffusers and return troughers in light fixture.
- In general, fungal burden on vertical surfaces was lower than that of horizontal surfaces.
- *Stachybotrys chartarum* was not detected from any air, wipes, or contact plate samples collected.
- Fungal levels in plenum, carpet, and furniture dust of these rooms were at 10^3 - 10^4 CFU/g of fine dust levels. *Stachybotrys chartarum* was detected from six of 27 dust samples.

RECOMMENDATIONS

- Conduct thorough cleaning of these rooms with HEPA vacuuming of porous materials and wet-wiping of hard surfaces.
- Conduct any above ceiling plenum work after hour. Thoroughly HEPA vacuum the surrounding areas afterwards.
- Implement an emergency water intrusion protocol for this building to adequately manage any unexpected water intrusion in order to prevent fungal proliferation.

ATTACHMENT A

Microbiological laboratory reports for samples collected
from tenth floor of SSMC-3, on February 8, 2000.

ATTACHMENT B

Results from microscopic examination of Zefon air samples collected
from tenth floor of SSMC-3, on February 8, 2000.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-28R-A

**Client agency: National Oceanic and Atmospheric Administration,
Silver Spring, MD**

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 2/8/00

Dates of inoculation: 2/8/00

General location: SSMC-3, Silver Spring, MD

Specific location: 10th floor

Sampling techniques: Air (Andersen N-6 sampler) and contact plate samplings

Medium used: Malt extract agar (MEA) and cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 2/18/00

(A) Air samples on MEA and CCA plates

Sample ID	Sampling Location	Air Volume (L)	Fungi on MEA @ 25° C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25° C

3-10628-0208A1, A2	10 th floor, room 10628, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
3-10627-0208A1, A2	10 th floor, room 10627, center of office	84.9	No fungal growth CFU/m ³ < 12	No
3-10636-0208A1, A2	10 th floor, room 10636, center of office	84.9	No fungal growth CFU/m ³ < 12	No
3-10637-0208A1, A2	10 th floor, room 10637, center of office	84.9	No fungal growth CFU/m ³ < 12	No
3-10651-0208A1, A2	10 th floor, room 10651, center of office	84.9	No fungal growth CFU/m ³ < 12	No
3-10652-0208A1, A2	10 th floor, room 10652, center of office	84.9	No fungal growth CFU/m ³ < 12	No
3-10632-0208A1, A2	10 th floor, room 10632, center of cube	84.9	No fungal growth CFU/m ³ < 12	No

Sample ID	Sampling Location	Air Volume (L)	Fungi on MEA @ 25° C	Presence of <i>Stachybotrys chartarum</i>*** on CCA @ 25° C
3-10640-0208A1, A2	10 th floor, room 10640, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
3-10670-0208A1, A2	10 th floor, room 10670, center of cube	84.9	No fungal growth CFU/m ³ < 12	No
3-10653-0208A1, A2	10 th floor, room 10653, center of office	84.9	No fungal growth CFU/m ³ < 12	No
Blank	Field blank	NA [#]	No fungal growth	No
OA281, 2	Outside	84.9	1. <i>Penicillium</i> (1*) 2. Basidiomycetes (5) CFU/m ³ = 71	No
OA283, 4	Outside	28.3	1. <i>Cladosporium</i> (1) CFU/m ³ = 35	No

(B) Contact plate samples on MEA plates

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C
3-10628-0208CP1	10 th floor, room 10628, column	1. <i>Aureobasidium</i> (1) CFU/plate = 1
3-10628-0208CP2	10 th floor, room 10628, front of lateral file	No fungal growth CFU/plate < 1
3-10628-0208CP3	10 th floor, room 10628, front of grey file	1. <i>Cladosporium</i> (1) CFU/plate = 1
3-10628-0208CP4	10 th floor, room 10628, desk 10628	1. <i>Aspergillus sp.</i> (2) 2. <i>Cladosporium</i> (1) 3. <i>Penicillium</i> (1) CFU/plate = 4

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C
3-10628-0208CP5	10 th floor, room 10628, desk 10630	1. <i>Cladosporium</i> (4) 2. <i>Penicillium</i> (1) 3. <i>Rhizopus</i> (1) CFU/plate = 6
3-10628-0208CP6	10 th floor, room 10628, shelf 10628	1. <i>Aspergillus sp.</i> (1) 2. <i>Paecilomyces</i> (1) CFU/plate = 2

3-10628-0208CP7	10 th floor, room 10628, shelf 10630	No fungal growth CFU/plate < 1
3-10627-0208CP1	10 th floor, room 10627, west wall near window	No fungal growth CFU/plate < 1
3-10627-0208CP2	10 th floor, room 10627, north wall above system furniture	No fungal growth CFU/plate < 1
3-10627-0208CP3	10 th floor, room 10627, south wall near dry erase	No fungal growth CFU/plate < 1
3-10627-0208CP4	10 th floor, room 10627, east wall above light switch	No fungal growth CFU/plate < 1
3-10627-0208CP5	10 th floor, room 10627, top of desk	1. <i>Cladosporium</i> (1) CFU/plate = 1
3-10627-0208CP6	10 th floor, room 10627, top of table	1. <i>Penicillium</i> (1) CFU/plate = 1
3-10627-0208CP7	10 th floor, room 10627, top of file	1. <i>Cladosporium</i> (1) CFU/plate = 1
3-10627-0208CP8	10 th floor, room 10627, top of shelf	1. <i>Penicillium</i> (11) 2. <i>Cladosporium</i> (2) CFU/plate = 13
3-10636-0208CP1	10 th floor, room 10636, south wall near window	1. <i>Cladosporium</i> (1) CFU/plate = 1

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C
3-10636-0208CP2	10 th floor, room 10636, north wall near door	No fungal growth CFU/plate < 1
3-10636-0208CP3	10 th floor, room 10636, east wall near window	No fungal growth CFU/plate < 1
3-10636-0208CP4	10 th floor, room 10636, west wall near table	No fungal growth CFU/plate < 1

3-10636-0208CP5	10 th floor, room 10636, desk top	No fungal growth CFU/plate < 1
3-10636-0208CP6	10 th floor, room 10636, table top	No fungal growth CFU/plate < 1
3-10636-0208CP7	10 th floor, room 10636, shelf over desk	1. <i>Alternaria</i> (1) CFU/plate = 1
3-10636-0208CP8	10 th floor, room 10636, window sill, south	No fungal growth CFU/plate < 1
3-10637-0208CP1	10 th floor, room 10637, south wall near window	1. <i>Cladosporium</i> (3) CFU/plate = 3
3-10637-0208CP2	10 th floor, room 10637, north wall near door	1. <i>Alternaria</i> (2) CFU/plate = 2
3-10637-0208CP3	10 th floor, room 10637, west wall adjacent to door	No fungal growth CFU/plate < 1
3-10637-0208CP4	10 th floor, room 10637, east wall @ column	No fungal growth CFU/plate < 1
3-10637-0208CP5	10 th floor, room 10637, top of desk	1. <i>Cladosporium</i> (1) CFU/plate = 1
3-10637-0208CP6	10 th floor, room 10637, table	1. <i>Aspergillus sp.</i> (3) 2. <i>Cladosporium</i> (1) CFU/plate = 4

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C
3-10637-0208CP7	10 th floor, room 10637, top of system furniture	1. <i>Aspergillus sp.</i> (2) CFU/plate = 2
3-10637-0208CP8	10 th floor, room 10637, top of file cabinet	1. <i>Aspergillus sp.</i> (1) CFU/plate = 1
3-10651-0208CP1	10 th floor, room 10651, south wall near window	No fungal growth CFU/plate < 1

3-10651-0208CP2	10 th floor, room 10651, north wall near door	No fungal growth CFU/plate < 1
3-10651-0208CP3	10 th floor, room 10651, east wall below dry erase	1. <i>Aspergillus niger</i>** (1) CFU/plate = 1
3-10651-0208CP4	10 th floor, room 10651, west wall near window	1. <i>Penicillium</i> (1) CFU/plate = 1
3-10651-0208CP5	10 th floor, room 10651, top of desk	1. <i>Cladosporium</i> (3) 2. <i>Aspergillus</i> sp. (1) CFU/plate = 4
3-10651-0208CP6	10 th floor, room 10651, top of table	No fungal growth CFU/plate < 1
3-10651-0208CP7	10 th floor, room 10651, top of system furniture	No fungal growth CFU/plate < 1
3-10651-0208CP8	10 th floor, room 10651, top of file cabinet	1. <i>Aureobasidium</i> (1) CFU/plate = 1
3-10652-0208CP1	10 th floor, room 10652, south wall near window	No fungal growth CFU/plate < 1
3-10652-0208CP2	10 th floor, room 10652, north wall near door	No fungal growth CFU/plate < 1
3-10652-0208CP3	10 th floor, room 10652, east wall	No fungal growth CFU/plate < 1

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C
3-10652-0208CP4	10 th floor, room 10652, west wall	No fungal growth CFU/plate < 1
3-10652-0208CP5	10 th floor, room 10652, top of desk	No fungal growth CFU/plate < 1

3-10652-0208CP6	10 th floor, room 10652, window sill	1. <i>Alternaria</i> (2) 2. <i>Cladosporium</i> (1) CFU/plate = 3
3-10652-0208CP7	10 th floor, room 10652, shelf over desk	1. <i>Cladosporium</i> (2) 2. <i>Paecilomyces</i> (2) 3. <i>Alternaria</i> (1) 4. <i>Aspergillus sp.</i> (1) 5. <i>Aureobasidium</i> (1) 6. <i>Penicillium</i> (1) CFU/plate = 8
3-10652-0208CP8	10 th floor, room 10652, shelf opposite desk	No fungal growth CFU/plate < 1
3-10632-0208CP1	10 th floor, room 10632, front of lateral file	No fungal growth CFU/plate < 1
3-10632-0208CP2	10 th floor, room 10632, front of small file	No fungal growth CFU/plate < 1
3-10632-0208CP3	10 th floor, room 10632, top of desk	1. <i>Penicillium</i> (1) CFU/plate = 1
3-10632-0208CP4	10 th floor, room 10632, top of system furniture	No fungal growth CFU/plate < 1
3-10632-0208CP5	10 th floor, room 10632, shelf of system furniture	1. <i>Aureobasidium</i> (1) 2. <i>Mucor</i> (1) CFU/plate = 2
3-10640-0208CP1	10 th floor, room 10640, front of lateral file	No fungal growth CFU/plate < 1

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

3-10640-0208CP2	10 th floor, room 10640, front of small file	1. <i>Paecilomyces</i> (2) CFU/plate = 2
3-10640-0208CP3	10 th floor, room 10640, top of desk	1. <i>Alternaria</i> (1) 2. <i>Aspergillus</i> sp. (1) 3. <i>Penicillium</i> (1) CFU/plate = 3
3-10640-0208CP4	10 th floor, room 10640, top of shelf	1. <i>Alternaria</i> (1) 2. <i>Cladosporium</i> (1) 3. <i>Rhizopus</i> (1) CFU/plate = 3
3-10640-0208CP5	10 th floor, room 10640, top of system furniture	1. <i>Aspergillus</i> sp. (1) 2. <i>Cladosporium</i> (1) 3. <i>Penicillium</i> (1) CFU/plate = 3
3-10670-0208CP1	10 th floor, room 10670, front of small file	No fungal growth CFU/plate < 1
3-10670-0208CP2	10 th floor, room 10670, front of small file	No fungal growth CFU/plate < 1
3-10670-0208CP3	10 th floor, room 10670, top of desk	1. <i>Cladosporium</i> (2) 2. <i>Alternaria</i> (1) 3. <i>Paecilomyces</i> (1) 4. <i>Pithomyces</i> (1) CFU/plate = 5
3-10670-0208CP4	10 th floor, room 10670, top of system furniture	No fungal growth CFU/plate < 1

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

3-10670-0208CP5	10 th floor, room 10670, shelf of system furniture	1. <i>Cladosporium</i> (4) 2. <i>Alternaria</i> (1) 3. <i>Aspergillus sp.</i> (1) 4. <i>Aureobasidium</i> (1) 5. <i>Nigrospora</i> (1) 6. <i>Penicillium</i> (1) CFU/plate = 9
3-10653-0208CP1	10 th floor, room 10653, south wall near window	1. <i>Penicillium</i> (2) 2. <i>Alternaria</i> (1) 3. <i>Cladosporium</i> (1) CFU/plate = 4
3-10653-0208CP2	10 th floor, room 10653, north wall near door	1. <i>Alternaria</i> (1) CFU/plate = 1
3-10653-0208CP3	10 th floor, room 10653, east wall near dry erase	No fungal growth CFU/plate < 1
3-10653-0208CP4	10 th floor, room 10653, west wall adjacent to door	No fungal growth CFU/plate < 1
3-10653-0208CP5	10 th floor, room 10653, top of desk	1. <i>Aspergillus sp.</i> (1) CFU/plate = 1
3-10653-0208CP6	10 th floor, room 10653, top of table	1. <i>Alternaria</i> (1) CFU/plate = 1
3-10653-0208CP7	10 th floor, room 10653, top of system furniture	1. <i>Cladosporium</i> (2) 2. <i>Epicoccum</i> (1) CFU/plate = 3

Sample ID	Sampling Location	Fungi detected on MEA @ 25° C

3-10653-0208CP8	10 th floor, room 10653, shelf of system furniture	1. <i>Alternaria</i> (1) 2. <i>Aspergillus sp.</i> (1) 3. <i>Paecilomyces</i> (1) CFU/plate = 3
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* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

Not applicable.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-28R-B

**Client agency: National Oceanic and Atmospheric Administration,
Silver Spring, MD**

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 2/8/00

Date of inoculation: 2/9/00

General location: SSMC-3, Silver Spring, MD

Specific location: 10th floor

Sampling technique: Wipe samplings

Medium used: Malt extract agar (MEA) and cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 2/22/00

Wipe samples on MEA and CCA plates

FOH ID	Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
W01	3-10653-0208S1	10 th floor, room 10653, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W02	3-10653-0208S2	10 th floor, room 10653, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W03	3-10653-0208R1	10 th floor, room 10653, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W04	3-10653-0208R2	10 th floor, room 10653, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W05	3-10652-0208S1	10 th floor, room 10652, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W06	3-10652-0208S2	10 th floor, room 10652, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W07	3-10652-0208R1	10 th floor, room 10652, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No

FOH ID	Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
W08	3-10652-0208R2	10 th floor, room 10652, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W09	3-10651-0208S1	10 th floor, room 10651, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No

W10	3-10651-0208S2	10 th floor, room 10651, supply	4	40X-MEA 10X-CCA	1. <i>Alternaria</i> (1*) CFU/in ² = 10	No
W11	3-10651-0208S3	10 th floor, room 10651, supply	4	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (1) CFU/in ² = 10	No
W12	3-10651-0208R1	10 th floor, room 10651, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W13	3-10651-0208R2	10 th floor, room 10651, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W14	3-10637-0208S1	10 th floor, room 10637, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W15	3-10637-0208S2	10 th floor, room 10637, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W16	3-10637-0208R1	10 th floor, room 10637, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W17	3-10637-0208R2	10 th floor, room 10637, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W18	3-10636-0208S1	10 th floor, room 10636, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W19	3-10636-0208S2	10 th floor, room 10636, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W20	3-10636-0208S3	10 th floor, room 10636, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No

FOH ID	Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C

W21	3-10636-0208S4	10 th floor, room 10636, supply	4	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (1) CFU/in ² = 10	No
W22	3-10636-0208S5	10 th floor, room 10636, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W23	3-10636-0208S6	10 th floor, room 10636, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W24	3-10636-0208R1	10 th floor, room 10636, return	5	40X-MEA 10X-CCA	1. <i>Epicoccum</i> (1) CFU/in ² = 8	No
W25	3-10636-0208R2	10 th floor, room 10636, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W26	3-10636-0208R3	10 th floor, room 10636, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W27	3-10636-0208R4	10 th floor, room 10636, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W28	3-10627-0208S1	10 th floor, room 10627, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W29	3-10627-0208S2	10 th floor, room 10627, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W30	3-10627-0208R1	10 th floor, room 10627, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W31	3-10627-0208R2	10 th floor, room 10627, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W32	3-10630-0208R1	10 th floor, room 10630, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W33	3-10630-0208R2	10 th floor, room 10630, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No

FOH ID	Sample ID	Sampling Location	Area (in ²)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
W34	3-10630-0208S1	10 th floor, room 10630, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W35	3-10607-0208S1	10 th floor, room 10607, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No
W36-1	3-10607-0208R1	10 th floor, room 10607, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W36-2	3-10632-0208R1	10 th floor, room 10632, return	5	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 8	No
W37	3-10640-0208S1	10 th floor, room 10640, supply	4	40X-MEA 10X-CCA	No fungal growth CFU/in ² < 10	No

* Colony counts.

*** Toxigenic fungi.

USPHS DFOH ENVIRONMENTAL MICROBIOLOGY LABORATORY, PHILADELPHIA, PA

LABORATORY REPORT #NOAA-00-28R-C

Client agency: National Oceanic and Atmospheric Administration, Silver Spring, MD

POIS#/task #: D8H00CO31200 / 9903

Sampling date: 2/8/00

Dates of inoculation: 2/10/00 and 2/11/00

General location: SSMC-3, Silver Spring, MD

Specific location: 10th floor

Sampling technique: Vacuum dust sampling

Medium used: Malt extract agar (MEA) and Cellulose Czapek agar (CCA) for fungi

Samples submitted by: J. Sobelman

Date characterization completed: 2/22/00

Dust samples on MEA and CCA plates

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V01	3-10628-0208V01	10 th floor, room 10628, furniture	0.103#	40X-MEA 10X-CCA	1. <i>Alternaria</i> (5*) 2. <i>Aureobasidium</i> (4) 3. <i>Penicillium</i> (4) 4. <i>Cladosporium</i> (3) 5. <i>Bipolaris</i> (2) 6. <i>Aspergillus sp.</i> (1) 7. <i>Epicoccum</i> (1) CFU/g = 3,883	Yes (1) CFU/g = 49
V02	3-10628-0208V02	10 th floor, room 10628, carpet	0.101	40X-MEA 10X-CCA	1. <i>Penicillium</i> (8) 2. <i>Aureobasidium</i> (2) 3. <i>Bipolaris</i> (1) 4. <i>Cladosporium</i> (1) 5. <i>Paecilomyces</i> (1) CFU/g = 5,149	No

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V03	3-10627-0208V01	10 th floor, room 10627, furniture	0.068 [#]	40X-MEA 10X-CCA	1. <i>Aspergillus niger</i>** (2) 2. <i>Aspergillus</i> sp. (1) 3. <i>Aureobasidium</i> (1) 4. <i>Penicillium</i> (1) CFU/g = 1,471	No
V04	3-10627-0208V02	10 th floor, room 10627, carpet	0.101	40X-MEA 10X-CCA	1. <i>Penicillium</i> (14) 2. <i>Aureobasidium</i> (3) 3. <i>Cladosporium</i> (2) 4. <i>Alternaria</i> (1) 5. <i>Epicoccum</i> (1) CFU/g = 8,317	No
V05	3-10636-0208V01	10 th floor, room 10636, furniture	0.101 [#]	400X-MEA 10X-CCA	1. <i>Alternaria</i> (4) 2. <i>Penicillium</i> (3) 3. <i>Bipolaris</i> (2) 4. <i>Cladosporium</i> (2) 5. <i>Aureobasidium</i> (1) 6. <i>Epicoccum</i> (1) 7. <i>Paecilomyces</i> (1) CFU/g = 2.8 x 10⁴	No

V06	3-10636-0208V02	10 th floor, room 10636, carpet	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (63) 2. <i>Cladosporium</i> (11) 3. <i>Aureobasidium</i> (4) 4. <i>Epicoccum</i> (1) 5. <i>Paecilomyces</i> (1) 6. Ascomycetes (4) CFU/g = 3.4 x 10⁴	No
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FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V07	3-10637-0208V01	10 th floor, room 10637, furniture	0.044 [#]	40X-MEA 10X-CCA	1. <i>Penicillium</i> (4) 2. <i>Alternaria</i> (2) 3. <i>Aureobasidium</i> (2) 4. <i>Paecilomyces</i> (1) CFU/g = 4,091	No
V08	3-10637-0208V02	10 th floor, room 10637, carpet	0.100	40X-MEA 10X-CCA	1. <i>Alternaria</i> (19) 2. <i>Cladosporium</i> (4) 3. <i>Penicillium</i> (4) 4. <i>Aspergillus</i> sp. (1) 5. <i>Paecilomyces</i> (1) 6. Ascomycetes (9) CFU/g = 1.5 x 10⁴	No

V09	3-10651-0208V01	10 th floor, room 10651, furniture	0.100 [#]	400X-MEA 10X-CCA	1. <i>Aureobasidium</i> (5) 2. <i>Alternaria</i> (2) 3. <i>Cladosporium</i> (2) 4. <i>Epicoccum</i> (1) 5. <i>Rhizopus</i> (1) CFU/g = 2.2 x 10⁴	No
V10	3-10651-0208V02	10 th floor, room 10651, carpet	0.100	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (14) 2. <i>Aureobasidium</i> (5) 3. <i>Penicillium</i> (3) 4. <i>Paecilomyces</i> (2) 5. <i>Aspergillus flavus</i> *** (1) CFU/g = 1.0 x 10⁴	No

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V11	3-10652-0208V01	10 th floor, room 10652, furniture	0.100 [#]	400X-MEA 10X-CCA	1. <i>Cladosporium</i> (12) 2. <i>Aureobasidium</i> (4) 3. <i>Alternaria</i> (3) 4. <i>Aspergillus sp.</i> (1) 5. <i>Penicillium</i> (1) CFU/g = 4.2 x 10⁴	No

V12	3-10652-0208V02	10 th floor, room 10652, carpet	0.101	40X-MEA 10X-CCA	1. <i>Aureobasidium</i> (5) 2. <i>Aspergillus versicolor</i> *** (2) 3. <i>Penicillium</i> (2) 4. <i>Alternaria</i> (1) 5. Ascomycetes (1) CFU/g = 4,356	Yes (4) CFU/g = 396
V13	3-10632-0208V01	10 th floor, room 10632, furniture	0.032 [#]	40X-MEA 10X-CCA	1. <i>Aureobasidium</i> (1) 2. <i>Cladosporium</i> (1) 3. <i>Epicoccum</i> (1) 4. Ascomycetes (1) CFU/g = 2,500	No
V14	3-10632-0208V02	10 th floor, room 10632, carpet	0.101	40X-MEA 10X-CCA	1. <i>Alternaria</i> (2) 2. <i>Penicillium</i> (1) CFU/g = 1,188	Yes (1) CFU/g = 99
V15	3-10640-0208V01	10 th floor, room 10640, furniture	0.080 [#]	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (12) 2. <i>Alternaria</i> (5) 3. <i>Epicoccum</i> (4) 4. <i>Aspergillus niger</i> ** (3) 5. <i>Rhizopus</i> (1) 6. Ascomycetes (4) CFU/g = 7,250	Yes (2) CFU/g = 125

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V16	3-10640-0208V02	10 th floor, room 10640, carpet	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (2) 2. <i>Alternaria</i> (1) 3. <i>Aspergillus niger</i> ** (1) 4. <i>Cladosporium</i> (1) 5. <i>Paecilomyces</i> (1) 6. Basidiomycetes (1) CFU/g = 2,800	Yes (3) CFU/g = 300
V17	3-10670-0208V01	10 th floor, room 10670, furniture	0.101 [#]	40X-MEA 10X-CCA	1. <i>Alternaria</i> (14) 2. <i>Epicoccum</i> (8) 3. <i>Cladosporium</i> (4) 4. <i>Aureobasidium</i> (2) 5. <i>Aspergillus</i> sp. (1) 6. <i>Penicillium</i> (1) CFU/g = 5,941	No
V18	3-10670-0208V02	10 th floor, room 10670, carpet	0.101	40X-MEA 10X-CCA	1. <i>Alternaria</i> (1) 2. <i>Chaetomium</i> (1) 3. Ascomycetes (29) CFU/g = 1.2 x 10⁴	No

V19	3-10653-0208V01	10 th floor, room 10653, furniture	0.065 [#]	400X-MEA 10X-CCA	1. <i>Aureobasidium</i> (7) 2. <i>Alternaria</i> (2) 3. <i>Penicillium</i> (2) 4. <i>Epicoccum</i> (1) 5. <i>Trichoderma</i> (1) CFU/g = 4.0 x 10⁴	No
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FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V20	3-10653-0208V02	10 th floor, room 10653, carpet	0.101	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (3) 2. <i>Penicillium</i> (3) 3. <i>Alternaria</i> (2) 4. <i>Aspergillus sp.</i> (1) 5. Ascomycetes (13) CFU/g = 8,713	No
V21	3-10652-0208AC1	10 th floor, room 10652, above ceiling	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (16) 2. <i>Cladosporium</i> (5) 3. <i>Alternaria</i> (2) 4. <i>Mucor</i> (1) CFU/g = 9,600	No

V22	3-10651-0208AC1	10 th floor, room 10651, above ceiling	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (81) 2. <i>Cladosporium</i> (8) 3. <i>Aspergillus niger</i> ** (2) 4. <i>Aspergillus sp.</i> (2) 5. <i>Epicoccum</i> (1) 6. <i>Paecilomyces</i> (1) CFU/g = 3.8 x 10⁴	No
V23	3-10653-0208AC1	10 th floor, room 10653, above ceiling	0.101	40X-MEA 10X-CCA	1. <i>Penicillium</i> (12) 2. <i>Aspergillus sp.</i> (2) 3. <i>Alternaria</i> (1) 4. <i>Aspergillus niger</i> ** (1) 5. <i>Aureobasidium</i> (1) 6. <i>Epicoccum</i> (1) CFU/g = 7,129	Yes (1) CFU/g = 99

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C

V24	3-10657-0208AC1	10 th floor, room 10657, above ceiling	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (12) 2. <i>Cladosporium</i> (9) 3. <i>Aspergillus niger</i> ** (2) 4. <i>Aspergillus sp.</i> (2) 5. <i>Chaetomium</i> (1) CFU/g = 1.0×10^4	No
V25	3-10636-0208AC1	10 th floor, room 10636, above ceiling	0.008##	NA@	NA	NA
V26	3-10627-0208AC1	10 th floor, room 10627, above ceiling	0.100	40X-MEA 10X-CCA	1. <i>Penicillium</i> (58) 2. <i>Cladosporium</i> (5) 3. <i>Aspergillus flavus</i> *** (1) 4. <i>Aspergillus niger</i> ** (1) CFU/g = 2.6×10^4	No
V27	3-10630-0208AC1	10 th floor, room 10630, above ceiling	0.062§	40X-MEA 10X-CCA	1. <i>Penicillium</i> (10) 2. <i>Cladosporium</i> (4) 3. <i>Aspergillus sp.</i> (2) 4. <i>Alternaria</i> (1) 5. <i>Aspergillus niger</i> ** (1) CFU/g = 7,200	No

FOH ID	Sample ID	Sampling Location	Weight (g)	Dilution factor	Fungi on MEA @ 25°C	Presence of <i>Stachybotrys chartarum</i> *** on CCA @ 25°C
V28	3-10607-0208AC1	10 th floor, room 10607, above ceiling	0.101	40X-MEA 10X-CCA	1. <i>Cladosporium</i> (8) 2. <i>Penicillium</i> (4) 3. <i>Aspergillus niger</i> ** (1) 4. <i>Epicoccum</i> (1) CFU/g = 5,545	No

* Colony counts.

** Opportunistic fungi.

*** Toxigenic fungi.

5ml of sterilized distilled water were added instead of 10ml.

Insufficient amounts of dust for analysis.

§ Equivalent amount of sterilized distilled water was added instead of 10ml.

@ Not applicable.